

## ABSTRACT

An apparatus for photonic transceiving spectrally replicates a photonic input signal to provide a replicated photonic signal. The replicated photonic signal contains multiple copies of the photonic input signal shifted to various wavelengths. The replicated photonic signal is then  
5 filtered to provide a photonic output signal within a desired passband. The photonic input signal may be spectrally replicated through a variety of mechanisms including four-wave mixing, modulation via a harmonically rich modulation waveform, recursive wavelength shifting and complementary recursive wavelength shifting.

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